Optimization of sterilization method, callus and shoot induction of catharanthus roseus explants

Abstract

Catharanthusroseus, the Madagascar periwinkle belongs to the family Apocynaceae. Vincristine and vinblastine alkaloids are the common anticancer compounds found in this plant. Sterilization procedures were optimized to eliminate contaminations. Two parameters; concentration of Chlorox® solutions (v/v) and incubation time (min) were optimized. Five concentrations of Chlorox® solutions were tested for leaf and petiole explants (5%, 8%, 10%, 12%, and 15%) and three concentrations for stem explants (10%, 15%, and 30%). The explants treated with different concentrations of Chlorox® solutions were then subjected to three incubation time; 15, 30, and 45 min. The optimal concentration of Chlorox® solution for stem explants was 30% (30 min) while for petiole and leaf explants, the optimal concentration was 12% (15 min). Young leaves, stems, and petioles from mature plant of C. roseus were placed on MS-based medium supplemented with NAA (0.75-1.25mg/l) and BA (0.25-0.30mg/l) to determine the type of explants and the optimum concentration of plant growth regulators for callus induction and shoot organogenesis. After 2 weeks of culture, all of the explants formed green and offwhite callus at the cut end of the explants. The highest frequency of callus formation was obtained from leaf explants 1.3g ± 0.4 (100%) at a combination of 0.2mg/l BA with 1.25mg/l NAA. Shoots were regenerated from petiole explants supplemented with 0.2mg/l BA with 0.75mg/l NAA at week 8. As for leaves and stems explants did not induce shoot formation in medium containing BA and NAA. Highest number of root per explants 0.8 ± 0.3 were regenerated from leaves explants the MS medium supplemented with 0.3mg/L BA and 1.0mg/L NAA. From the results, the best explants for callusing and shoot induction are petiole of C. roseus.